Lipoma in Channel Catfish (Ictalurus punctatus Rafinesque)

Authors: McCoy, C. P., Bowser, P. R., Steeby, J., Bleau, M., and Schwedler, T. E.

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tained populations of both invasive neoplastic smooth muscle and testicular cells (Fig. 5).

Epithelial and mesenchymal neoplasms are not uncommon in boney fishes (Osteichthyes) (Wellings, 1969, Nat. Cancer Inst. Monogr. 31: 59–121). Seminomas and leiomyosarcomas are reported but are rare (Schlumberger and Lucké, 1948, Can. Res. 8: 657–696; Budd and Schroder, 1969, Bull. Wildl. Dis. Assoc. 5: 315–318; McKnight, 1977, Aquaculture 13: 55–60; Wellings, 1969, op. cit.).

We could only find one report of a tumor in the albino African lungfish, a melanosarcoma of the intestine (Harshbarger, 1977, Activities Report, Registry of Tumors in Lower Animals: 1976 Supplement, Smithsonian Institution, Washington, D.C., p. 18). A spermatocytic seminoma has been reported in the African lungfish (*Protopterus aethiopicus*) (Harshbarger, 1982, Activities Report, Registry of Tumors in Lower Animals: 1981 Supplement, Smithsonian Institution, Washington, D.C., p. 22).

It was not possible to determine if the neoplasms in this fish were metastatic. It is probable they were invasive of the kidney, because of the proximity and the fact that invasive growth is common in malignant tumors of fish (Van Duijn, 1973, Diseases of Fishes, ILIFFE Books, London, England, p. 268).

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Lipoma in Channel Catfish (*Ictalurus punctatus* Rafinesque)

C. P. McCoy and P. R. Bowser, College of Veterinary Medicine, Mississippi State University, Mississippi State, Mississippi 39762, USA; **J. Steeby and M. Bleau,** Mississippi Agriculture and Forestry Experiment Station, Delta Branch Experiment Station, Stoneville, Mississippi 38776, USA; **and T. E. Schwedler,** Mississippi Cooperative Extension Service, Delta Branch Experiment Station, Stoneville, Mississippi 38776, USA

Lipomas are benign tumors of adipose tissue that are common in mammals (Moulton, 1978, Tumors of Domestic Animals, University of California Press, Berkley, California, 465 pp.), and have been reported in a number of species of fishes (Mawdesley-Thomas, 1971, Current Topics in Comparative Pathobiology, Academic Press, New York, New York, 277 pp.; Wellings, 1969, Nat. Cancer Inst. Monogr. 31: 59–128; Harshbarger, 1982, Registry of Tumors in Lower Animals, National Museum of Natural History, Smithsonian Institution, Washington, D.C., 55 pp.). This is the first report of a lipoma in channel catfish.

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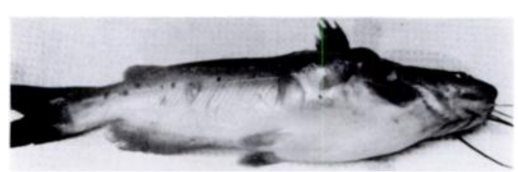

FIGURE 1. Channel catfish with multiple subcutaneous lipomas.

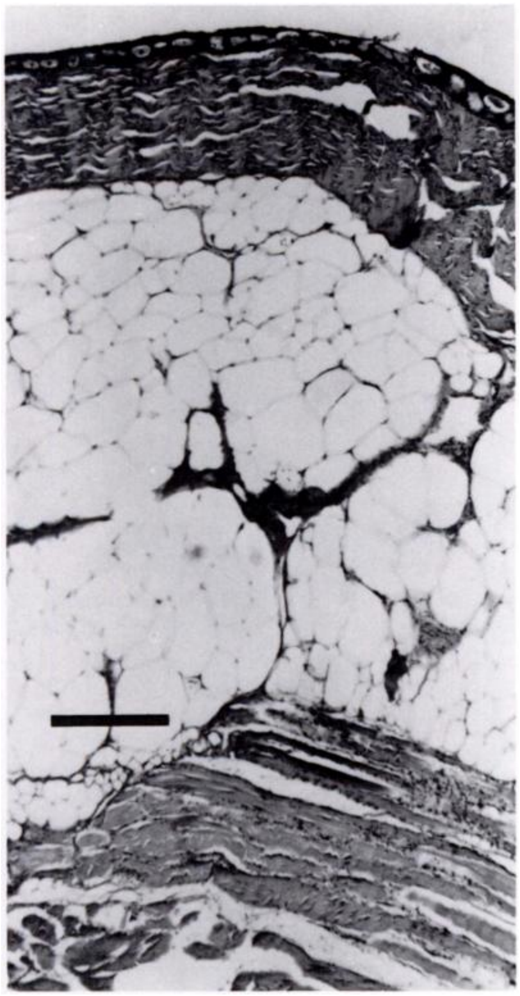

FIGURE 2. Section of a lipoma from a channel catfish showing separation of the dermis from underlying trunk muscles by well differentiated adipocytes. (Bar = 100 μm.)

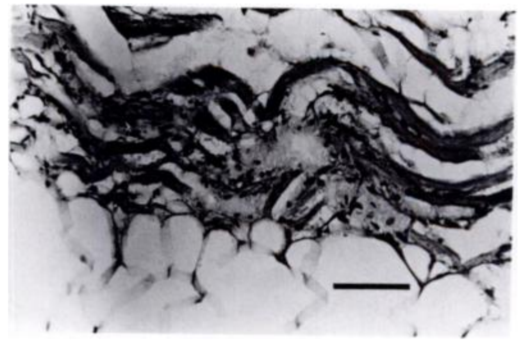

FIGURE 3. Section of lipoma from a channel catfish showing entrapped muscle cells. (Bar = 50 μm.)

Three channel catfish were presented for evaluation of abnormal swellings. The fish were subadult (0.3–0.5 kg) and originated from two commercial catfish production ponds and from a research pond. One fish had a single tumor (3 cm in diameter) located on the dorsal midline anterior to the dorsal fin. One fish had two tumors: (1) 4 cm posterior to the dorsal fin (2.5 cm diameter) and (2) adjacent to the vent and infiltrating into the anal fin (4 cm × 2.5 cm). One fish (Fig. 1) had multiple tumors: (1) posterior to the right operculum on the lateral body flank (5 cm × 3 cm), (2) and (3) dorsal to the anal fin on the right body flank (1 cm diameter each). Cut sections of the tumors were soft, white and greasy. No other lesions were noted. No parasites of significance were found and cultures were negative for bacteria. Tissue samples were fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned at 6 μm and stained with hematoxylin and eosin (H&E).

Histologically the tumors were similar and consisted of well differentiated adipocytes with single large vacuoles in the cytoplasm, eccentric dark nuclei, and prominent cell membranes, separating the dermis from the trunk muscles. Bundles of myocytes were occasionally surrounded by tumor cells. The tumors were neither circumscribed nor encapsulated and frequently infiltrated between and around myocyte bundles of underlying muscles. Muscle fibers within these bundles were often shrunken, vacuolated and stained variably (Fig. 3).

Subcutaneous adipose tissue normally occurs in channel catfish to varying degrees depending on fish age, size and state of nutrition, but does not cause nodular proliferations.

These tumors were similar to lipomas described in mammals (Moulton, 1978, op. cit.) in that they were composed of well-differentiated adipose cells, but were not well circumscribed and lightly encapsulated as are lipomas in mammals. In these respects they resembled, but were less invasive than, infiltrative lipomas previously described in man (Dionne et al., 1974, Cancer 33: 732–738; McChesney et al., 1980, Vet. Pathol. 17: 316–322) and in dogs (McChesney, 1980, op. cit.). These fish were from commercial and experimental catfish production ponds that were not known to contain chemical carcinogens or carcinogenic pollutants.

We thank Dr. John C. Harshbarger for his assistance in identifying these tumors and for including them in Registry of Tumors in Lower Animals (RTLA no. 2837, 2838, and 2839), National Museum of Natural History, Smithsonian Institution, Washington D.C. 20560, USA.

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Secondary Poisoning of Franklin's Gulls in Texas by Monocrotophos

Donald H. White, U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, School of Forest Resources, University of Georgia, Athens, Georgia 30602, USA; **and Elizabeth J. Kolbe,** Patuxent Wildlife Research Center, Laurel, Maryland 20708, USA

On 4 June 1983, 45 dead Franklin's gulls (*Larus pipixcan*) were found at a freshwater pond on the Santa Ana National Wildlife Refuge (NWR) near Alamo, Texas. The birds were collected by Refuge personnel and frozen in polyethylene bags. Also, a sample of small cicadas (Cicadidae), probably regurgitated earlier by the dying gulls, was collected at the pond near the gulls and frozen. On 8 June, five healthy Franklin's gulls were shot at the Refuge and frozen to serve as controls in determining the cause of mortality. Brain acetylcholinesterase (AChE) assays were conducted on a sample of the birds found dead plus controls on 17 June and the proventriculi were shipped frozen to Patuxent Wildlife Research Center for chemical analysis of contents. Apparently, the die-off occurred over several days, for only seven birds found dead were suitable for brain assays and none of these were saved for necropsy.

AChE determinations were made using the method of Ellman et al. (1961, Biochem. Pharmacol. 7: 88–95) as modified by Hill and Fleming (1982, Environ. Toxicol. Chem. 1: 27–38). Contents of individual proventriculi were analyzed for organophosphate and carbamate insecticides following White et al. (1982, J. Field Ornithol. 53: 22–27). The lower limit of quantification was 0.1 ppm, wet weight. Insecticide concentrations were confirmed by mass spectrometry in two samples.

AChE activities in brains of birds found dead and of controls and insecticide concentrations in their proventricular contents are shown in Table 1. AChE activity in birds found dead was extremely inhibited, averaging 95% below the average for controls, and was well below the 50% depression level indicative of death from an AChE inhibitor (Ludke et al., 1975, Arch. Environ. Contam. Toxicol. 3: 1–21). The proventriculi of all birds found dead contained small cicadas; one specimen had 83. Cicadas also were present in proventriculi of control birds. Monocrotophos [(E)-phosphoric acid, dimethyl (1-methyl-

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